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HATCHING OF JAPANESE AYU EGGS IN THE UNITED STATES

What was probably the first successful attempt to hatch the eggs of the Japanese samlet, or ayu (*Plecoglossis altivelis*) in the United States occurred December 14, 1922. The circumstances are as follows:

On November 22, 1922, the College of Fisheries received from Prof. C. Ishikawa of the Imperial University, Tokyo, about 10,000 eggs of the ayu. The manner in which these eggs are generally collected in Formosa is very interesting.

Thin mats of what appears to be cocco nut fiber are placed on the bottom of the streams where the ayu spawn. The fish spawn over these mats and the eggs adhere to the fibers. The mats are then removed with the eggs attached and cut into convenient sizes for shipping. Those which reached us were tacked to square wooden frames. A similar method could be used in collecting spawn of American smelts which is similar to that of the ayu. The trays were placed in a shipping case and handled like other fish eggs in transit.

When the case was opened, unfortunately, about 25 percent of the eggs were dead. The trays were placed in a large aquarium supplied with running water. Living eggs were examined and the embryoes appeared to be well developed. The eggs are about the size of those of *Osmerus mordax* and appear to be very much like them except that the ayu eggs are rather opaque instead of being transparent.

The first larvae hatched December 11, but the remainder hatched on December 14, the temperature of the water being 44 degrees F. The larvae were like those of *Osmerus mordax* in general appearance and size, but when the larvae of the ayu were compared under the microscope with larvae of *O. mordax* the two could be distinguished by details of the arrangement of the black chromatophores.

None of the larvae lived longer than a few days probably on account of the low temperature and lack of the proper food. Prof. Ishikawa wrote that the temperature of the streams where the ayu spawn is 50 degrees F. or higher.

Japanese students who are familiar with the ayu have told the writer that the ayu is not considered very valuable as a food fish but that it is cooked on account of the aromatic odor which results during cooking, particularly with other fish. It is apparent that the word *ayu* refers to the sweet *smell* rather than *taste*. In this connection it is interesting to note that the eulachon, *Thalyichthys pacificus*, emits a very pleasing smell not at all like that we usually associate with fish while frying.

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FIELD NOTES ON *XANTUSIA HENSHAWI*

In a recent copy of Copeia (No. 146, p. 71), Miss Sarah R. Atsatt presented an interesting account of her observations of *Xantusia henshawi* in captivity. To this record I desire to add some items from my field note book.

It should first be stated that the new method of capture whereby a species lately considered excessively rare may now be taken in numbers, is not my discovery, as stated by Miss Atsatt. I was initiated into this procedure by the late Dr. J. Van Denburgh, and his assistant, Mr. J. R. Slevin, who first tried it at Mountain Spring as early as May, 1923.

In capturing these lizards the collector searched amongst granite boulders for loose flakes partially spalled from the parent rock. These are pried off by means of a pinch bar or other suitable tool and if a lizard is found beneath he is quickly covered with a hand while still light struck. The fingers are then worked around to the head and the game is bagged. Care must be taken not to hold the tail or it will be dropped.

The operator must so place himself before the flake that he will not lose his balance (nor be beneath) when it falls; otherwise he cannot use the requisite speed and his quarry escapes. Dodging the falling flake, which may weigh from a few pounds to several hundred, and avoiding the scorpions and centipedes while covering the lizards, lends interest to the hunt.

I have recently improved on the pinch bar by employing a long handled prospector's pick with a flat prying blade at the handle end of the shaft. The pick is useful for overturning flakes lying on the ground without stooping. Under such loose pieces I have found a number of snakes, including *Lichanura roseofusca*, *Masticophis lateralis*, *Lampropeltis californiae californiae*, *Hypsiglena ochrorhynchus*, *Crotalus exsul* and *C. oreganus*. Snakes and other lizards, such

as *Sceloporus orcutti*, *Uta stansburiana hesperis*, etc., are not infrequently found under flakes attached to the boulders, but not under the close fitting flakes that *Xantusia* seems to prefer. In such locations they are apparently safe from all enemies.

Xantusia henshawi has previously been reported only from Witch Creek, Poway and La Puerta Valley, San Diego County. To this record I am now able to add Descanso, Viejas, Mountain Spring, Wynola, Wildwood, Buckman's Spring, Pine Valley, Grossmont, Flynn Springs, Mussey, Tecate, Glen Lonely, Foster, Dulzura, Jacumba, Boulevard, Cottonwood, Grapevine, Hillsdale, Jamacha, Alpine, La Posta, El Monte, Harbison Cañon, Campo and Ramona. In fact I have had few negative records where granite boulders of suitable consistency to flake are present anywhere in the Upper or Lower Sonoran zones. I have as yet no Transition records, searches on Palomar and Cuyamaca Mountains thus far proving negative. The maximum altitude recorded to date is 3780 feet at La Posta; the minimum 450 feet near Grossmont.

This lizard has now been taken in Imperial County over the line at Mountain Spring. As it has been found within a few hundred feet of the Mexican line at Tecate it unquestionably occurs in Lower California. I have no doubt it will be found plentiful in Riverside County, although my northern record is Valley Center.

I have taken specimens in every month from February to October inclusive. They are most plentiful in April and May. At such times they are discovered under the thinnest surface flakes, usually on the south and west sides of the boulders where the sun's warmth is most evident. On the other hand after the summer heat in the district back from the Coast has become oppressive they are more difficult to locate and are usually under the thicker slabs and on the shady side. It is probably that at such times the majority are deep in the inaccessible crevices between boulders.

ERIC KNIGHT JORDAN
1903–1926

Eric Knight Jordan was killed in an automobile accident on March 10, 1926. Born in San Francisco on September 27, 1903, the son of David Starr Jordan and Jessie Knight Jordan, he had shown in early boyhood unusual ability in scientific research. Before he entered the University, he had made a collection of the Mollusks of California and prepared a Manual on the subject. This manuscript embodied valuable original work, and a monograph on the Molluscan Fauna of Trinidad Head, Cal., which he wrote at the age of fifteen, was published by the U. S. National Museum.

After graduating in Geology and Zoology from Stanford (1923), he made, in 1924, under the auspices of Cornell University, a large collection of fishes from Hawaii. He took part later in a biological and geological survey of the Off Shore Islands of Mexico, and also in a survey of the middle portion of Lower California. He was Assistant Curator in Geology in the California Academy of Sciences at the time of his death.

Eric Jordan had inherited the splendid physique, the devotion to science, and the personal charm of David Starr Jordan. He leaves a widow, Elizabeth Roper Jordan, a bride of only a month. The scientific world can but tender its respectful sympathy to one of its leaders, so tragically bereaved; and mourn for so fair a promise, never to be fulfilled.

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The likeliest flakes in the spring months are those which are thin and well up the sides of the boulders. They vary in area from a few square inches to many square feet. If they are sufficiently raised from the boulder surface to insert a pinch bar tip, then there is room for one of these exceedingly flat lizards. The vertical flakes are more likely hiding places than the horizontal which rest on the boulder tops. The rock walls must be clean; if soil has been deposited in the crevice it will be found untenanted. The lizards can rarely be seen before the flake has been pried off and it is not remarkable that they were scarce before the pinch bar was used. Where flakes are of good quality about one in ten should yield a specimen and about half of those seen can be caught. If two persons cooperate, one wielding the bar while the other catches the lizards, nearly all can be secured. They do not usually congregate together, but I have found as many as five under a single large flake.

The largest specimen taken measured 149 mm. over all; length of tail 85 mm. The species is ovoviviparous, as proved by a specimen taken September 3 which contained two well developed embryos. The young seem more numerous under the flakes in the late fall and early spring.

Interesting color changes may be noted in the field. Immediately upon being uncovered the lizards are almost entirely black or dark olive green with a thin tracery of yellow lines. The tails are dark with wider white lines. After exposure the lighter lines, originally thin and thread like, spread so as to cover a considerable portion of the total area, leaving the original dark portions as isolated spots.

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RECORDS OF SOME AMPHIBIANS AND REPTILES FROM KENTUCKY

In June 1925, at the invitation of Dr. W. D. Funkhouser of the Department of Zoology, University of Kentucky, Professor C. R. Crosby and Mr. P. J. Chapman of Cornell University, Professor B. S. Bronson of the State College for Teachers, Albany, N. Y., and the writer visited the university Zoological Field Laboratory located at Quicksand in Breathitt County. Here in the heart of the "Knobs" region we collected for a number of days and worked over territory which has much to offer the exploring biologist. We were materially assisted by Dr. W. R. Allen and his students and by Mrs. W. D. Funkhouser and Miss Thelma MacIntyre of Lexington who visited the laboratory during our short stay.

We arrived at Quicksand about noon on June 23. For many days before our visit there had been little rain and the prospect of securing amphibians did not seem very bright. However a single specimen of *Hyla versicolor* was found in the afternoon and during the evening a few toads, (*Bufo fowleri*), called. In the roadways and open spaces many recently transformed toads appeared. On June 24th rain fell at intervals throughout the day and left pools of standing water in which all the frogs and toads of the neighborhood congregated. By sundown hundreds of individuals of *Bufo fowleri*, *Hyla versicolor* and *Hyla crucifer* had reached the pools and were singing in chorus.

The following records pertain to specimens captured at Quicksand or its immediate vicinity:

Plethodon cinereus (Green). One small specimen collected June 26.

Gyrinophilus porphyriticus (Green). Rose branch, Quicksand, June 25. One 86 mm. larva.

Pseudotriton ruber ruber (Sonnini). A single adult specimen 111 mm. long found under a dry log at Fallen Rock branch, June 27.

Eurycea bislineata bislineata (Green). Meeting house branch, June 26. Seventeen larvae apparently of this species.

Desmognathus fuscus fuscus (Rafinesque). This is the commonest species of the region. Quicksand specimens are, in general, considerably lighter in color than those found farther north and have a rather distinct dorsal pattern consisting of a broad, light, median band with dark, broken edges and numerous small dark spots. The belly in the majority of specimens is very light with only a very slight indication of mottling. Specimens were secured at the following localities: Meeting house branch, June 26, nine adults and three larvae; Still house branch, June 26, twelve specimens of various sizes; Rose branch, June 24, eleven specimens.

Desmognathus phoca Matthes. One or two specimens from the vicinity of Quicksand collected by Mr. Leonard Giovannoli earlier in the month.

Frogs and Toads—

Bufo fowleri Garman, June 23. A few called in the evening of June 23 and following the rain on June 24 many appeared in the rain water pools and called throughout the night.

Hyla crucifer Wied, June 24. Dozens of individuals in company with Fowler's toad and *Hyla versicolor.*

Hyla versicolor versicolor (Leconte), June 23. A single specimen discovered on the veranda of the laboratory, June 24. Many individuals in and around the rain pools on logs and rubbish.

Lizards and Snakes—

Sceloporus undulatus (Latreille), June 24. A large female with eight well developed eggs within the body.

Eumeces fasciatus (Linné), June 24. A female with eight eggs taken from beneath damp boards. June 24, a single specimen found under a railroad tie.

Carphophis amoena (Say), June 26. A single specimen found in a rotting log by the roadside.

Opheodrys aestivus (Linné), June 26. A large specimen found on Stillhouse branch.

Coluber constrictor constrictor (Linné). A specimen captured in the immediate vicinity of Quicksand was kept alive for a time at the laboratory.

Natrix sipedon sipedon (Linné), June 24. Under a log at the side of the road a single specimen of moderate size. Another specimen apparently of this species was seen in a rain pool.

On June 29 we visited Phelp's cave (about three miles from Lexington, Ky.) and near the entrance, in the half light, found four specimens of *Eurycea lucifuga* Rafinesque. July 1 was spent in Mammoth Cave and in the woods bordering Green river near the outlet of Echo river. Under moss and bits of rock just within the main entrance of the cave proper, two specimens of *Eurycea lucifuga* were found. From beneath rotting logs on a dry hillside two large specimens of *Plethodon glutinosus* were collected and in an old stump, a small specimen. One of the large individuals was peculiar in that it lacked almost entirely the light spots, and in life the legs were pinkish. This is suggestive of the coloration of *Plethodon shermani.*

Bufo fowleri and *Hyla versicolor* were both heard calling in the evening of July 1 and a single specimen of *Rana palustris* Le Conte was captured in the woods near the hotel.

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